Paediatric Lasers Bibliography Review

2023 – May 2025

Dr Pablo Balboa/Dr Samira B Syed

Weekly Pulsed Dye Laser Treatments for Port-Wine Birthmarks in Infants

Shirin Bajaj, MD[1,2]; Joy Tao, MD[1]; David A. Hashemi, MD, MBA[1]; et al

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JAMA Dermatol. 2024;160(6):606-611. doi:10.1001/jamadermatol.2024.0293

- 10 patients <20 weeks old with PWB received once-weekly PDL treatment
- 7 patients achieved near-total or total clearance at 2 months. The other 3 required further treatment (min 2 – max 20)
- No adverse events. No need for GA

Systematic Review

Multiple General Anesthesia in Children: A Systematic Review of Its Effect on Neurodevelopment

Giacomo Colletti [1,2], Mattia Di Bartolomeo [3,*], Sara Negrello [4], Roy G. Geronemus [5], Bernard Cohen [6], Luigi Chiarini [1], Alexandre Anesi [1], Raimondo Feminò [7], Ilaria Mariotti [8], Gregory M. Levitin [2], Linda Rozell-Shannon [2] and Riccardo Nocini [9]

- A total of 264.759 unexposed children and 11.027 exposed children were assessed for neurodevelopmental outcomes
- Only one paper did not find any statistically significant between the groups for neurodevelopmental alterations
- It is recommended to carefully evaluate the risks and benefits of administering several GAs in children <3 years old

Largest comparative analysis: Novel large spot size 595 nm, high-energy, pulsed dye laser reduces number of treatments for improvement of adult and pediatric port wine birthmarks

Pooja Sodha MD, Jordan V. Wang MD, MBE, MBA, Nader Aboul-Fettouh MD, Katherine Martin MD, Roy G. Geronemus MD, Paul M. Friedman MD

- 160 patients treated with PPDL or NPDL (randomised 1:1)
- NPDL: mean 13.1 mm spot size, and 7.3 J/cm2 with pulse durations of 0.45–3 ms
- PPDL: mean 10.8 mm, and 8.8 J/cm2 with pulse durations of 0.45–6 ms
- NPDL achieved 50% improvement in PWBs with fewer treatments (PPDL 8.8 vs. NPDL 4.3). No difference in final outcome

The 595-nm Wavelength Pulsed Dye Laser for Pediatric Port-Wine Birthmarks and Infantile Hemangiomas: A Systematic Review

David A. Hashemi, Joy Tao, Jordan V. Wang, Roy G. Geronemus

First published: 16 December 2024 | https://doi.org/10.1002/lsm.23864 | Citations: 2

- 33 articles with 7725 total patients were included
- Only 16 (0.8%) of the 2,033 patients with PWB and 11 (0.2%) of the 5692 patients with haemangioma reported permanent adverse effects
- Near or complete clearance after PDL–on average or in greater than 50% of patients–was reported in 17/19 PWB studies, and 7/7 IH studies

ORIGINAL ARTICLE

Pediatric Dermatology WILEY

Multicenter retrospective review of pulsed dye laser in nonulcerated infantile hemangioma

Sonal D. Shah MD[1] | Erin F. Mathes MD[2] | Eulalia Baselga MD[3] | Ilona J. Frieden MD[2] | Julie Powell MD[4] | Maria C. Garzon MD[5] | Kimberly D. Morel MD[5] | Christine T. Lauren MD[5] | Anthony J. Mancini MD[6] | Sarah L. Chamlin MD[6] | Mónica Ríos MD[7] | Lina Belmesk MD[4] | Catherine C. McCuaig MD[4]

- 117 patients with IH were treated with PDL
- 99/117 treated >12 months old
- Mean age of first laser 46.7 +/- 35.3 months, and 4.2 +/- 2.8 number of treatments
- 73.7% received additional medical management
- Those who received propanol prior to PDL received 1.1 fewer sessions
- PDL is effective in improving residual telangiectasias and erythema with a low incidence of adverse effects and good tolerability

CASE REPORT

Delayed ulceration following combination pulse dye laser and topical sirolimus treatment for port wine birthmarks: A case series

Catherine Grace P. Hobayan BS, Elizabeth J. Nourse MD, Michela M. Paradiso MD, Esteban Fernandez Faith MD

First published: 12 August 2023 | https://doi.org/10.1111/pde.15409 | Citations: 3

- 3 patients with PWB received PDL treatment and topical sirolimus 1% twice daily
- Sirolimus applied 2-4 weeks before laser and resumed day after
- Two patients developed crusting 10 and 21 days after PDL with sirolimus
- One patient had an ulceration 2 weeks after on the face. One patient had detectable subtherapeutic levels <2ng/mL

Adjuvant Topical Sirolimus for Pulsed Dye Laser in Pediatric Capillary Malformation

Gu, Yaron BSc (Med) Hons*,†; Sebaratnam, Deshan Frank MBBS (Hons), MMed, FRCP (London), FACD*,†

Author Information

Dermatologic Surgery 50(3):p 300-301, March 2024. | *DOI:* 10.1097/DSS.0000000000004047

- 10 Paediatric patients with CM. Median age 4 months (1.5 weeks to 5 years)
- Total of 83 PDL treatments, 82% alongside 0.1% sirolimus ointment twice daily
- Burns occured in 8.4% treatments and post-treatment purpura lasted longer.
- Despite this, only 1 patient elected to discontinue topical sirolimus and all patients achieved good cosmetic outcomes

Lasers Med Sci. 2025 Feb 3;40(1):60. doi: 10.1007/s10103-025-04326-w.

30 years' experience in the use of cutaneous lasers for the treatment of verrucous venous malformations in children: a retrospective cohort study at Great Ormond Street Hospital for children

Afshaun Azad [1], Emilio Schweighart Gate [2], Giulia Rinaldi [3], Hadi Alenezi [3], Samira Batul Syed [3]

- 47 of 83 patients had enough data and were treated with PDL and PDL-Nd:YAG
- Red lesions responded better than purple ($p<0.005$) for surface area (SA) and colour
- Purple lesions responded better to PDL-Nd:YAG
- SA reduction PDL 71.11% (red), 6.67% (purple) – PDL-Nd:YAG 54.3% and 32.35%
- Combination of PDL 585 nm and Nd:YaG 1064 nm superimposed by PDL at 595 nm
- Colour improvement PDL 53,13 (red), 8,59% (purple) – PDL-Nd:YAG 46,88% and 40,81%

Observational Study Lasers Med Sci. 2025 Apr 7;40(1):179. doi: 10.1007/s10103-025-04433-8.

Perioral scarring in the paediatric cohort as a complication of laser treatment for port wine birthmarks

Rinaldi Giulia [1] [2], Samira Syed Batul [3], Mitesh Ramwani [3]

- 139 patients with perioral PWB treated
- Incidence of perioral scarring was 4.3% (6 patients)
- The complications from laser therapy can be minimised by early recognition of pre-scarring signs, nursing advice and early treatment

Lasers Med Sci. 2025 Mar 18;40(1):146. doi: 10.1007/s10103-025-04401-2.

Effectiveness and safety of the 1064 nm long-pulsed Nd: YAG laser for treating pyogenic granuloma children: a retrospective study of 30 patients

Yuxin Lv [# 1], Li Liu [# 2], Xiaoyan Luo [# 3]

- 30 patients treated with 1064 nm long-pulsed Nd: YAG laser with fluences of 85-130 J/cm^2 and pulse width of 10-40 msec at one-month intervals
- 28 improved after one treatment, the rest required two treatments
- Recurrence-free after 6 months
- One patient had a scar, and 2 had post-inflammatory hyperpigmentation

Treatment of keloids with pulsed dye laser in a pediatric population

Riccardo Cavalli,[1] Nicola Adriano Monzani,[2] Italo Francesco Aromolo[3]

[1]Pediatric Dermatology Unit, Department of Clinical Sciences and Community Health, Foundation IRCCS Ca' Granda Ospedale Maggiore Policlinico, Milan; [2]Department of Clinical Science and Community Health, University of Milan; [3]Department of Pathophysiology and Transplantation, University of Milan, Italy

- 16 Paediatric patients with keloid treated with PDL performing a double passage treatment in the same session, 8-9 J/cm2 10 msec followed by 8-9 J/cm2 1.5 msec, with impulse overlapping
- 14/16 achieved moderate to excellent clearance. No side effects
- 13 were satisfied with the results

Laser Surgery in Pediatric Skin of Color Patients: A Systematic Review

Shaliz Aflatooni[1] | Nicholas Chin[1] | Amberlyn Colina[1] | Andrew C. Krakowski[2] | Lilia Correa-Selm[3,4] | Thomas Beachkofsky[5]

- 164 Paediatric patients with FST IV-VI
- Lasers with longer wavelengths (Nd:YAG) can reduce complications
- Lower fluences and longer pulse durations are recommended
- Early intervention, cooling devices and longer wavelengths can reduce complications and have better outcomes
- Pre and post treatment with hydroquinone cream and epidermal cooling has reduced the risk of dyspigmentation

Picosecond alexandrite laser treatment of nevus of Ota in children

Wenwen Zhao BSN, Ying Yang MD, Hualing Shi BSN, Lifang Guo MD, Hui Ding MD, Huiying Zhen MD, Tong Lin MD, Yiping Ge MD

First published: 06 May 2024 | https://doi.org/10.1002/lsm.23795

- 305 Paediatric patients with nevus of Ota treated with 755nm picosecond Alex laser
- Fluences (2.83-4.07 J/cm2) , PW 750ps and spot size 2.5-3mm
- After two treatments achieving an average of 79% pigment cleared
- 16 patients with complete clearance relapsed after 3-5 year
- Rate of recurrence 6.6%
- 12.1% had a side effect (10.8% was post-inflammatory hypopigmentation)

Combination Laser Treatment in Procedural Management of Congenital Melanocytic Nevi

Serena Y. Tsai, Martin R. Buta, Branko Bojovic, Mia A. Mologousis, R. Rox Anderson, Elena B. Hawryluk, Yakir S. Levin

First published: 03 April 2025 | https://doi.org/10.1002/lsm.70007

- 13/158 children with CMN treated with laser therapy alone
- Treated with long-pulsed laser and Q-Switched laser, followed by a resurfacing laser
- Median number of treatments: 7
- All patients showed pigment reduction with mild adverse events
- Some repigmentation was noted in the follow-up visits